

CLAIMS

1. A vaccine for inducing a cell-mediated cytolytic immune response against an antigen in a mammal comprising the antigen and all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the stress protein to induce the immune response to the antigen.
2. The vaccine of Claim 1 wherein the stress protein is a mycobacterial stress protein or a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the mycobacterial stress protein to induce the immune response to the antigen in the mammal to whom it is administered.
3. The vaccine of Claim 1 wherein the stress protein is selected from the group consisting of: hsp65 and hsp71.
4. The vaccine of Claim 1 wherein the antigen and the stress protein are linked by chemical conjugation.
5. The vaccine of Claim 1 wherein the antigen and the stress protein are linked as a fusion protein.
6. A vaccine for inducing a cell-mediated cytolytic immune response against an antigen in a mammal comprising a polynucleotide which encodes and directs expression of an antigen and a stress protein sequence in the mammal.

7. The vaccine of Claim 6 wherein the antigen and the stress protein are expressed as a fusion protein.
8. The vaccine of Claim 6 wherein the stress protein sequences are from a mycobacterial stress protein or a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the mycobacterial stress protein to induce the immune response to the antigen in the mammal to whom it is administered.
9. The vaccine of Claim 6 wherein the stress protein is selected from the group consisting of: hsp65 and hsp71.
10. A vaccine for inducing a cell-mediated cytolytic immune response against an antigen of an influenza virus in a mammal comprising a polynucleotide which directs expression of the antigen of the influenza virus and a stress protein in the mammal.
11. The vaccine of Claim 10 wherein the stress protein is a mycobacterial stress protein or a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the mycobacterial stress protein to induce the immune response to the antigen in the mammal to whom it is administered.
12. The vaccine of Claim 10 wherein the stress protein sequences are selected from the group consisting of: hsp65 and hsp71.

13. A vaccine for inducing an immune response to an influenza virus in a mammal comprising an antigen of the influenza virus and all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the stress protein to induce the immune response against the antigen.
5
14. The vaccine of Claim 13 wherein the stress protein is a mycobacterial stress protein or a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the mycobacterial stress protein to induce the immune response against the antigen in the mammal to whom it is administered.
10
15. The vaccine of Claim 13 wherein the antigen of the influenza virus is selected from the group consisting of: hemagglutinin, nucleoprotein, neuraminidase, M1, M2, PB1, PB2, PA and a combination thereof.
15
16. The vaccine of Claim 13 wherein the immune response is a cytolytic T cell response.
17. The vaccine of Claim 13 wherein the stress protein is selected from the group consisting of: hsp65 and hsp71.
20
18. A vaccine for inducing an immune response to an influenza virus in a mammal comprising an antigen of the influenza virus conjugated to all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous
25

to the amino acid sequence of the stress protein to induce the immune response to the antigen.

19. The vaccine of Claim 18 wherein the stress protein is a mycobacterial stress protein or a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the mycobacterial stress protein to induce an immune response in an individual to whom it is administered.
20. The vaccine of Claim 18 wherein the antigen of the influenza virus is selected from the group consisting of: hemagglutinin, nucleoprotein, neuraminidase, M1, M2, PB1, PB2, PA and a combination thereof.
21. The vaccine of Claim 18 wherein the immune response is a cytolytic T cell response.
22. The vaccine of Claim 18 wherein stress protein is selected from the group consisting of: hsp65 and hsp71.
23. A vaccine for use in inducing an immune response to an influenza virus in a mammal comprising a recombinant fusion protein which includes an antigen of the influenza virus fused to all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the stress protein to induce the immune response against the antigen.
24. A vaccine of Claim 23 wherein the stress protein is a mycobacterial stress protein or a protein having an

amino acid sequence sufficiently homologous to the amino acid sequence of the mycobacterial stress protein to induce an immune response in an individual to whom it is administered.

- 5 25. The vaccine of Claim 23 wherein the antigen of the influenza virus is selected from the group consisting of: hemagglutinin, nucleoprotein, neuraminidase, M1, M2, PB1, PB2, PA and a combination thereof.
- 10 26. The vaccine of Claim 23 wherein the immune response is a cytolytic T cell response.
27. The vaccine of Claim 23 wherein the stress protein is selected from the group consisting of: hsp65 and hsp71.
- 15 28. A composition comprising a stress protein and an antigen of an influenza virus.
- 20 29. The composition of Claim 28 wherein the stress protein is a mycobacterial stress protein or a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the mycobacterial stress protein to induce an immune response in an individual to whom it is administered.
- 25 30. The composition of Claim 28 wherein the antigen of the influenza virus is selected from the group consisting of: hemagglutinin, nucleoprotein, neuraminidase, M1, M2, PB1, PB2, PA and a combination thereof.

31. The composition of Claim 28 wherein the stress protein is selected from the group consisting of: hsp65 and hsp71.
- 5 32. A conjugate comprising a stress protein joined with an antigen of an influenza virus.
33. The conjugate of Claim 32 wherein the stress protein is a mycobacterial stress protein or a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the mycobacterial stress
10 protein to induce an immune response in an individual to whom it is administered.
34. The conjugate of Claim 32 wherein the antigen of the influenza virus is selected from the group consisting of: hemagglutinin, nucleoprotein, neuraminidase, M1,
15 M2, PB1, PB2, PA and a combination thereof.
35. The conjugate of Claim 32 wherein the stress protein is selected from the group consisting of: hsp65 and hsp71.
- 20 36. A fusion protein comprising a stress protein fused to an antigen of the influenza virus.
37. The fusion protein of Claim 36 wherein the stress protein is a mycobacterial stress protein or a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the mycobacterial stress
25 protein to induce an immune response in an individual to whom it is administered.

- 5 38. The fusion protein of Claim 36 wherein the antigen of the influenza virus is selected from the group consisting of: hemagglutinin, nucleoprotein, neuraminidase, M1, M2, PB1, PB2, PA and a combination thereof.
39. The fusion protein of Claim 36 wherein the stress protein is selected from the group consisting of: hsp65 and hsp71.
- 10 40. A fusion protein selected from the group consisting of: pET65MP/NP-B and pET65M/NP-D.
41. The vaccine of Claim 1 wherein the antigen includes a cytolytic T cell epitope.
42. The vaccine of Claim 10 wherein the antigen of the influenza virus includes a cytolytic T cell epitope.
- 15 43. The vaccine of Claim 15 wherein the antigen of the influenza virus includes a cytolytic T cell epitope.
44. The composition of Claim 28 wherein the antigen of the influenza virus includes a cytolytic T cell epitope.
- 20 45. The conjugate of Claim 32 wherein the antigen of the influenza virus includes a cytolytic T cell epitope.
46. The fusion protein of Claim 36 wherein the antigen of the influenza virus includes a cytolytic T cell epitope.

47. The vaccine of Claim 1 wherein the antigen is selected from the group consisting of: a viral antigen, a tumor associated antigen and an allergen.
- 5 48. The conjugate of Claim 32 wherein the antigen is selected from the group consisting of: a viral antigen a tumor associated antigen and an allergen.
48. The fusion protein of Claim 36 wherein the antigen is selected from the group consisting of: a viral antigen a tumor associated antigen and an allergen.
- 10 49. A vaccine for suppressing a Th2 response to an allergenic antigen in a mammal comprising the antigen and all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the stress protein to suppress the Th2 response to the antigen.
- 15
50. A composition for suppressing a Th2 response to an allergenic antigen in a mammal comprising the antigen and all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the stress protein to suppress the Th2 response to the antigen.
- 20
51. A conjugate for suppressing a Th2 response to an allergenic antigen in a mammal comprising the antigen and all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of
- 25

the stress protein to suppress the Th2 response to the antigen.

52. A fusion protein for suppressing a Th2 response to an allergenic antigen in a mammal comprising the antigen and all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the stress protein to suppress the Th2 response to the antigen.